

DENISON (C.)

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FAVORABLE RESULTS OF  
KOCH'S TUBERCULIN TREATMENT  
IN TUBERCULAR AFFECTIONS THAT ARE NOT PULMONARY.

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THE use of tuberculin is either stoutly decried or held in abeyance by the large majority of physicians and surgeons. If the majority were to rule in the determination of such use there could be little advance in this direction. But the mass of physicians have decided this question by hearsay or second hand, while many others are frank enough to admit the immunity-producing effect of the remedy, but conclude that the liability to error in the diagnosis of concealed *pulmonary* tuberculosis is so great and the knowledge of the limitations of the remedy and the technique of its administration so essential and particular that they hesitate to employ it.

By others it is named a toxine, and that is sufficient argument against its use for them, notwithstanding the strong probability that there is an antitoxine, an immunity effect, produced by its use in the tubercular individual's system which they have not recognized.

The truth undoubtedly is that the difficulties with re-

gard to its use in pulmonary tuberculosis are increased about fivefold because of the five times greater activity of the capillary circulation there, greatly augmenting the tendency to overaction—to exaggerated necrotic effects in the lung tissue affected, the exact nature of which an *ordinary* physical diagnosis does not determine. The usual shortcomings of the medical profession in the proper diagnosis and understanding of concealed lung tuberculosis thus become positive hindrances to the extended use of Koch's tuberculin.

The exceptional experience, however, of such men as Trudeau, von Ruck, and Whittaker, with whom the writer would feel honored to be classed, tends to give confidence in the cautious use of tuberculin, on lines different from those proposed by its inventor, and in selected cases of pulmonary tuberculosis. These lines or indications are such as the rarely-found *uncomplicated* tubercular infection, the chronic state, and the existence already of favorable resistance in the patient's blood to tubercular invasion.

The diagnosis of tuberculosis by tubercular injections is now a generally admitted fact by a larger number of physicians than those who favor its use in treatment, and the extended use of tuberculin by veterinarians to determine tuberculosis in cattle is confirming the desirability of this procedure. Thus far the writer has made twelve positive diagnoses of human tuberculosis almost solely by this means.

There are, however, some surgeons, like Dr. Senn, of Chicago, who do not recognize any value in the remedy. It is for such and other doubting minds that these cases of joint and bladder disease are here submitted. They are such as can not be explained away by the argument of climatic effect, and as for other medical treatment, very little or none was used; and I am firmly convinced that the re-



sults obtained should be credited to the new method of cure.

The case of tubercular cystitis first described is unique in the experience of the writer, and as this patient's business (auditor of the Bell Telephone Company) has called him to every prominent city in the United States, he has consulted and much interested many physicians and surgeons. He has been examined from time to time by Dr. C. A. Powers, who verifies the condition and the improvement.

CASE I.—H. C. B., of Dedham, Mass., aged fifty-four years, widower, was first seen at Denver, on January 16, 1895. In 1884, after three years' sickness, his wife died of consumption in the South, where they were living because of Mr. B.'s failing health. There is a possibility of her having been infected with tuberculosis from him, because in 1878 he had throat trouble, was confined in the house a month, was much run down, and went South. In 1879, after his return to Massachusetts, he got weak again, and his doctor sent him South to reside. Weight then, a hundred and twelve pounds. Had a cough and yellow expectoration. Resided in Aiken, S. C., from 1879 to 1886. Had been a soldier in the army at the time of the rebellion, and from then till a year ago had great pain at times in his left kidney, said to be "gravel." He took morphine only from doctors until last August, when on leaving the hospital, where he had been under treatment some three months, he took himself about a fourth of a grain a day, and now sometimes reaches three fourths of a grain. He suffered great pain in his bladder and did no work from June 6 to November 30, 1894, and came to Colorado January 15, 1895, not appreciating the elevation by any effect upon his lungs. Had had night sweats before going South, but never any hæmorrhages or profuse expectoration. Weight at best, a hundred and sixty pounds in 1890; at lowest, a hundred and twelve in 1879; now a hundred and forty pounds. In the army he had diarrhœa; now his bowels are inclined to be loose. Has no expectoration or cough. Sleep is much disturbed, and he suffers at times with severe pain in his bladder.

While under Dr. Cabot's treatment in Boston a few tubercular bacilli were found in his urine, after many trials, in October, 1894. In Denver we have found two to many fields examined. Pulse, 72; respiration, 18; temperature, 98° F., at 11 A. M. Spirometrical record two hundred and ten cubic inches; manometer eighty millimetres. Physical examination shows the lungs to be in fair condition, there being only slight dullness at the left apex, with some broncho-vesicular respiration there. However, subsequently, under the tuberculin treatment, from a ten-milligramme dose to seventy and above, continued reaction sounds were noticed in the lower half of his left lung both front and rear. The urine was thick, cloudy, of high specific gravity, and contained pus and sometimes blood. It was voided with great frequency, sometimes as often as every twenty minutes during the night and every five to ten minutes in the daytime, and his attacks of pain were very severe. In washing out the bladder he could hold only two ounces of fluid, and always asked to be permitted to relieve himself on arrival at the office.

The diagnosis of tubercular cystitis, with probable latent (healed) trouble in the left lung and perhaps in the bowels, was fully confirmed by the reactions to the tuberculin treatment, which was urged upon him by the writer. The first dose—four milligrammes of Koch's tuberculin—was given him February 14, 1895, and by various degrees of increase and intervals of administration eighty milligrammes were reached, when he went to Salt Lake on business for three weeks. The reactions had been positive, though more general than febrile; a temperature of 99.5° F. was reached several times, and twice he felt so badly that he was unable to take the next dose for three days. But good effect, always in due time, succeeded these reactions.

The diagnosis was positive at the ten-milligramme dose, when the lung reaction was marked—*i. e.*, the high-pitched, harsh, broncho-vesicular breathing sound was noticed over the left mammary and inferior scapular regions, which the writer has found to be the peculiar effect (in the tubercular lung) of this toxic or antitoxic influence. Later the diagnosis was also positive in the backache and distress in the neck of the bladder

which succeeded the injections of larger doses—thirty to seventy milligrammes. And later on still the original diagnosis was further confirmed by the diarrhoea which was seemingly caused at times by larger doses—a hundred and sixty to a hundred and eighty milligrammes. The improvement in the bladder was, however, as might be expected, more noticeable after the larger doses—*i. e.*, above fifty milligrammes. Gradually the urine became clearer, was voided much less often—every two hours—and in larger quantities. By the time the eighty-milligramme dose was reached he had reduced the morphine taken three fourths, and some days after left it off entirely. He gained in weight, spirits, and looks.

Though half a dozen trials have been made with different specimens of his urine, no bacilli have been found since the treatment was well under way.

*April 15, 1895.*—The following note is appended to his record: “Was over in Salt Lake three weeks, and since his return has gone on with the tuberculin injections up to a hundred and thirty milligrammes to-day. Urinates only five times during the night. Weight in Boston, a hundred and thirty-five pounds, now a hundred and forty two pounds. Looks and feels much better.”

*May 3d.*—Took injections up to a hundred and seventy milligrammes every other day to date. Urine contains no bacilli, but streptococci are present. Feels better to-day than any day since last June.

*21st.*—Has been taking the injections every four days of late. Reactions have been slight. Weight, a hundred and forty pounds, a gain of six pounds since March 8th. Looks and feels better. Less frequent micturition, and no bacilli found at this time in the lessened sediment. Thinks he must return East on his business. He will continue the tuberculin injections with lengthening intervals and report progress.

In our next case, that of tubercular hip-joint disease, we have the advantage of a longer term of observation:

CASE II.—Miss M. S., aged twenty-three, who came to Colorado in 1881 and has resided in Fort Collins, was first seen on



August 13, 1894. She is the youngest of thirteen children, only six of whom are living. The mother at sixty-five looks sallow and emaciated, and appears not to have been well for thirty years. Latent tuberculosis is suspected. She was said to have had "dropsy of the liver," and, what was peculiar, six of her children were jaundiced and died under two weeks of age. This patient was never strong as a child. She had typhoid fever six years ago. She seemed to be well, when four years ago she fell into a basement and struck on her right hip. She gradually became affected with hip disease, so that she could not walk by the next May. She was in bed six months with a weight on her right limb and wore a brace for two years. Walked, if at all, with two crutches for three years and now uses one. Has had sore throat every winter for five or six years, and this is worse now. Coughed all winter for three winters and raised sputum at times. Coughs less now. She has no night sweats or profuse expectoration, but there was some bloody expectoration from the throat last winter.

Weight at most before the accident, a hundred and fifty-five pounds; now, a hundred and twelve pounds. Expectoration very little. None could be obtained for examination. It is doubtful if there are any bacilli. Pain in hip; appetite fair; digestion negative for meats and fats; bowels regular and catamenia scanty. Leucocytosis imperfect, as shown by paucity of leucocytes in the blood, and most of these are granular, swollen, or broken. Lips and finger-nails blanched, and hæmoglobin evidently deficient, though not exactly determined. Pulse 104, respiration 26, and temperature 99° F. (10 A. M.). Spirometrical record a hundred and forty cubic inches; manometer, forty-five millimetres. Pharynx shows elevations which make us suspicious of tuberculosis. Chest expansion twenty-eight to thirty inches and a half—about equal on the two sides. Physical examination not very positive. Bronchial characteristics slightly extended. "Cog-wheeled" respiration to the right of and above the base of the heart, and prolonged expiration and broncho-vesicular breathing to the left, with slight dullness at the apices. The changed voice and breath sounds, though slight, centre around the borders of the inner apices front and rear,



which, with the suspicious laryngeal and pharyngeal state, are strongly indicative of tuberculosis. Decided on the diagnostic test with tuberculin, and the proposition was at once accepted. Two injections of one and one and a half milligrammes of Koch's lymph left no doubt as to the character of the case. The constitutional effect was characteristic and remarkable. The prostration at the second treatment was so great that she fainted in the office, and afterward a temperature of 103° F. was reached.

One week later, September 11, 1894, steady treatment with the same remedy was commenced, going back in dose and increasing very cautiously. The following notes are from the record:

*October 28th.*—Have worked up to eighty milligrammes, and reaction breath sounds were and are considerably diffused. There have been distinct effects in the throat and hip in response to the larger doses. She can walk easier and her hip is better. There have been some cheesy deposits in the elevations on the tonsils, but her throat now looks much improved. Blood condition is decidedly better, and no fever reactions follow the large doses.

*November 10th.*—Worked up to a one-hundred-and-thirty-milligramme dose to-day. Weight, a hundred and eighteen pounds. Is gaining.

*December 18th.*—Weight, a hundred and nineteen pounds and a half. She has been taking a one-hundred-and-thirty-milligramme dose each week for five weeks, and goes back to Fort Collins after treatment. Feels better and can walk without a crutch.

*January 9, 1895.*—She has been taking a hundred and ten to a hundred and thirty milligrammes of tuberculin about once a week. Comes to the office without her crutch. Has gained to a hundred and twenty-five pounds weight.

*March 5th.*—Weight, a hundred and thirty-one pounds and a half, a gain of twenty-one pounds and a half since October.

*April 23d.*—Comes about every ten days from Fort Collins and takes a hundred and twenty milligrammes. There are no reactions and improvement continues. She has discarded her

crutch entirely and limbs very little. She can step up a stair, using the foot of the lame leg first, which she has not been able to do for four years. Last week Dr. C. A. Powers kindly examined the patient and confirmed the diagnosis of tubercular hip-joint disease. The prognosis is thought to be excellent; the supposed difference in the measurements on the two sides is found to be due to the tilting of the pelvis. Weight now a hundred and thirty-three pounds. Muscular strength comes back slowly, but the general improvement is decided.

CASE III.—L. J. G., a man, aged twenty-two years, telegrapher from New York State.

*October 7, 1893.*—Arrived yesterday. A sister died of hip disease and a brother was operated on for abscess of the hip and recovered. Six years previously this patient had strained his right hip and has been a cripple for five years. On September 28, 1889, Dr. Roswell Park, of Buffalo, operated on this hip for an abscess (resection?) and some benefit resulted for eighteen months. The abscess returned in the same place, and Dr. Park operated again in October, 1891. In January, 1892, a sinus formed opening into the right groin; also one in the right nates. These are still discharging. Dr. Park, finding numerous bacilli in the sputum, relinquished his intention of again operating and sent the young man to me. I found the right lung in the first stage with bronchiectasis, and the left in the second stage of tubercular disease. The whole left upper lobe being involved, and with his hip discharging a drachm or more a day and exercise impossible, I could not see how the climate here could meet the conditions. The case was to me hopeless, unless some immunity could be produced. He had night sweats and profuse expectoration—now two ounces—thick and yellow, containing many bacilli “to the field.” Pulse, 96; respiration, 24; temperature, 102° F. (3 P. M.); spirometrical record, a hundred and thirty-five cubic inches; manometer, forty millimetres. Weight in health, a hundred and forty-two pounds; now, a hundred and twelve pounds.

*10th.*—Tuberculin injections were commenced very gradually at first, because of the double infection and extreme susceptibility.

*April 10, 1894.*—The record states how a dose of sixty-five milligrammes of tuberculin has been gradually reached and that some reactionary sound is still appreciable at the base of the right lung, rear and apex of the left front, where, over the left bronchus, there is yet almost "cracked metal" on stethoscopic percussion and mucous râles on coughing. But the bacilli have evidently been driven from the sputum, which is one half reduced in quantity. The discharge from the hip is very little indeed; strength much increased; color better; and weight, nearly a hundred and eighteen pounds; in fact, general improvement. His temperature has gradually decreased under the treatment.

*September 4th.*—The patient has been out on a ranch near Morrison and has taken no medicine during the summer. About August 1st he caught cold and had high fever. Some fever yet— $101^{\circ}$  F. Weight, a hundred and eighteen pounds; looks better, bowels regular, and appetite good; expectoration lessened three fourths, manometer and spirometer records increased. Measurements of chest increased from twenty nine and thirty-two inches on arrival to thirty and thirty-three inches and a half now. Slight dullness and some mucous râles on coughing still remain at the apices front, especially the left.

*January 19, 1895.*—Have increased the dose of tuberculin given every four to six days up to a hundred and thirty milligrammes at highest, and the control of the temperature rise, which was to  $102^{\circ}$  F., has been beautifully illustrated by his progress since the commencement of this second series of injections. The general improvement has been decided. His chest sounds are much drier; spirometer record, a hundred and fifty cubic inches; and manometer, ninety millimetres; a decided gain. Weight, a hundred and nineteen pounds.

His improvement continued after this, and what was remarkable, his temperature remained nearly normal for months. His low financial state and inability to get suitable work have been discouraging. Contrary to my advice, he went back East in May. His condition, however, was favorable—more than simple arrest of the disease. He has a certain degree of immunity to rely on.



In the face of such evidence as this\* (and with proper discrimination, the use of tuberculin in *pulmonary* tuberculosis has as good a defense), and in the presence of a patient who declares that the authorities of a certain place where he has been, urged by certain local physicians, have sought to interdict the use of tuberculin at all, the writer must express his chagrin for the unreasonable fear and prejudice of some of his profession. He feels justified in saying that one such case as the second here given is worthy of more credence than a hundred failures by others who as likely as not have not appreciated the remedy or the conditions under which it should be used.

The writer trusts his own course has been consistent since four years ago in the Denver Medical Association he demonstrated an immunity or healing principle contained in tuberculin, announced the discovery of the peculiar reactionary breath sound due to the healing process in tubercular-affected lung tissue, and declared that even should the medical fraternity decide against the use of tuberculin he would continue himself to use it, or some of the to-be-discovered derivatives of it, in his practice. Ever since that time, when the writer has been at home in Denver, he has used the drug and found ample justification in this positive, though sometimes necessarily more or less transitory, immunizing influence.

Of one hundred and thirty or more patients treated, all but one of thirty-three *without softening* (excluding a few of whom traces have been lost) are known to be living, and forty-five out of ninety-seven who had reached or passed the stage of softening in lung tissue are also known to be

\* For description of other interesting cases, including one of chronic tubercular meningitis and another of tubercular knee-joint disease of long standing, see *Diagnosis of Tuberculosis by Tuberculin Injections*, *New York Medical Journal* of February 3, 1894.

living, of whom twenty-seven are favorable results in single- or double-cavity cases.

It should be understood as quite possible that unjust and unwarrantable explanation of assumed unfavorable results of tuberculin treatment in certain cases may be made. Perhaps that can not be wholly avoided under existing conditions, but if a reference to patients were the desirable procedure, the writer could name quite a number who now, even after several years, enjoy something of the immunizing influence conferred upon them by tuberculin. But how would the reader judge and what would he do with the voluminous records of their examination and lives? He is already tired out, no doubt, with this presentation, which is respectfully submitted with the regret that so large a subject should be limited to so small a time for its consideration.





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FRANK P. FOSTER, M.D.

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